WHAT IS CLAIMED IS:

| | 1 | 1. A cleaning system adapted for cleaning semiconductor processing |
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| | 2 | equipment, said cleaning system comprising: |
| | 3 | a remote dissociator coupled to said equipment by a transport mechanism; |
| | 4 | a local dissociator integrally related to said equipment; and |
| | 5 | a precursor disposed in said remote dissociator; |
| | 6 | wherein said remote dissociator is operable to dissociate said precursor to |
| | 7 | create a first plurality of cleaning radicals, said cleaning radicals entering said transport |
| | 8 | mechanism, a first portion of said cleaning radicals entering said equipment and a second |
| i serie | .9 | portion of said cleaning radicals recombining to create a plurality of less reactive |
| | 10 | elements in said transport mechanism, said less reactive elements entering said |
| ************************************** | l 1 | equipment, and said local dissociator operable to dissociate a portion of said less reactive |
| House diese House Heavy | 12 | elements to create a second plurality of cleaning radicals. |
| | | |
| 93; | 1 | 2. The cleaning system of claim 1 further comprising an optical |
| 1/4 1/4 1/4 | 2 | endpoint detector, wherein said detector indicates completion of a cleaning of said |
| Mea⊭ | 3 | equipment. |
| 1.00 | 1 | 3. The cleaning system of claim 1, wherein said remote dissociator |
| ğunk | 2 | provides a greater than 75% dissociation efficiency, whereby PFCs in an exhaust from |
| | 3 | said cleaning system are reduced. |
| | 1 | |
| | 1 | 4. The cleaning system of claim 1, wherein said first portion of said |
| | 2 | cleaning radicals is less than said second portion of said cleaning radicals. |
| | 1 | 5. The cleaning system of claim 1, wherein said second plurality of |
| | 2 | cleaning radicals includes ions. |
| | | |
| | 1 | 6. The cleaning system of claim 5, wherein said cleaning radicals |
| | 2 | include at least one of: Cl, F, Cl ions, or F ions. |
| | 1 | 7. A method of cleaning a semiconductor processing equipment, said |
| | 2 | method comprising: |
| | 3 | introducing a precursor to a dissociator; |
| | 4 | dissociating said precursor to create a first plurality of radicals; |
| | | 7 P |

|) | introducing a first portion of said first plurality of radicals to said |
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| 6 | equipment, a second portion of said first plurality of radicals re-associating to create less |
| 7 | reactive elements; |
| 8 | introducing said less reactive elements to said equipment; and |
| 9 | dissociating said less reactive elements to form a second plurality of |
| 0 | radicals in said equipment. |
| 1 | 8. The method of claim 7, wherein said dissociating said precursor |
| 2 | provides at least 75% dissociation efficiency, whereby PFCs in an exhaust from said |
| 3 | system equipment are reduced. |
| | |
| 1 | 9. The method of claim 7, wherein said second portion of said first |
| 2 | plurality of radicals is greater than said first portion of said first plurality of radicals. |
| 1 | 10. The method of claim 9, wherein said precursor comprises a |
| 2 | flourinated species capable of supplying atomic flourine. |
| | |
| 1 | 11. The method of claim 7, wherein said second plurality of radicals |
| 2 | includes cleaning ions. |
| 1 | 12. The method of claim 11, wherein said cleaning ions include at least |
| 2 | one of F ions or Cl ions. |
| 1 | |
| 1 | 13. The method of claim 7, wherein said dissociating said less reactive |
| 2 | elements creates physical sputtering. |
| 1 | 14. The method of claim 7, wherein said less reactive elements include |
| 2 | at least one of F_2 or Cl_2 . |
| 1 | 15. The method of claim 7, further comprising: introducing a second |
| 2 | 15. The method of claim 7, further comprising: introducing a second precursor to said equipment. |
| _ | precursor to said equipment. |
| 1 | 16. The method of claim 15, wherein said second precursor comprises |
| 2 | oxygen. |
| 1 | 17. The method of claim 16, wherein said oxygen combines with |
| 2 | carbon on said equipment to form CO |

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| | 1 | 18. A method of cleaning a semiconductor processing equipment, said |
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| | 2 | method comprising: |
| | 3 | introducing a first precursor to a remote dissociator; |
| | 4 | dissociating said first precursor to create a first plurality of radicals; |
| | 5 | introducing said first plurality of radicals to said equipment; |
| | 6 | introducing a second precursor to said remote dissociator; |
| | 7 | dissociating said second precursor to create a second plurality of radicals; |
| | 8 | introducing a first portion of said second plurality of radicals to said |
| | 9 | equipment, a second portion of said second plurality of radicals re-associating to create |
| | 10 | less reactive elements; |
| | l 1 | introducing said less reactive elements to said equipment; and |
| Will Street Team | 12 | dissociating said less reactive elements to form a third plurality of radicals |
| Hand thank | 13 | in said equipment. |
| \$19.H | | |
| and | 1 | 19. The method of claim 18, wherein said third plurality of radicals |
| 10 Sept. 10 Mg | 2 | comprise Cl and said first plurality of radicals comprise F. |
| | 1 | 20. The method of claim 18, wherein said dissociating said first |
| And, Ann Lum H. A. Sin L. Keel Sines Fr | 2 | precursor includes forming a first plasma and said dissociating said less reactive elements |
| tysé Judi | 3 | includes forming a second plasma. |
| | | The state of the s |
| | 1 | 21. A semiconductor equipment cleaning system comprising: |
| | 2 | a housing; |
| | 3 | a remote dissociator configured to dissociate a first gas remote from said |
| | 4 | housing, said dissociation forming a second gas; |
| | 5 | a gas delivery system to introduce a portion of said first gas, a portion of |
| | 6 | said second gas, and a re-associated portion of said second gas into said housing. |
| | 7 | a local dissociator configured to dissociate said re-associated portion of |
| | 8 | said second gas; |
| | 9 | a controller for controlling said remote dissociator, said gas delivery |
| 1 | 0 | system, and said local dissociator; and |
| 1 | 1 | a memory coupled to said controller, said memory comprising a computer- |
| 1 | 2 | readable medium having a computer-readable program embodied therein for directing |

| | 13 | operation of said semiconductor cleaning system, said computer-readable program |
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| | 14 | comprising: |
| | 15 | an instruction to control said remote dissociator; |
| | 16 | an instruction to control said gas delivery system; and |
| | 17 | an instruction to control said local dissociator. |
| | 1 | 22. A computer-readable storage medium having a computer-readable |
| | 2 | program embodied therein for directing operation of a semiconductor cleaning system, |
| | 3 | said semiconductor cleaning system comprising an equipment, a remote dissociator, a |
| | 4 | local dissociator, and a gas delivery system configured to introduce a gas from said |
| | 5 | remote dissociator into said equipment, said computer-readable program including |
| | 6 | instructions for operating said semiconductor cleaning system in accordance with the |
| 100 m | 7 , | following: |
| nen men anne anne ure ur ur inne K. Krey Sory S. F. g. Prog. Sr. g. S. R. ared verel har drot deal beat | 8 | introducing a precursor to said remote dissociator; |
| Maria Services | 9 | dissociating said precursor to create a first plurality of radicals; |
| | | introducing a first portion of said first plurality of radicals to said |
| | l 1 | equipment by way of said gas delivery system, a second portion of said first plurality of |
| **.! 1 | 12 | radicals re-associating to create less reactive elements; |
| 1 | 13 | introducing said less reactive elements to said equipment by way of said |
| 1 | 4 | gas delivery system; and |
| | .5 | dissociating said less reactive elements to form a second plurality of |
| 1 | .6 | radicals in said equipment. |
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